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Eleventh Annual Meeting

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November 1, 2, 3, 1943

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NATIONAL LUBRICATING GREASE INST NLGI

Fatty Acids

Preparation, Physical and Chemical Properties, Uses in Soaps and Protective Coatings

By A. G. H. REIMOLD, President, Woburn Chemicals, Ltd., Toronto

Up until about twenty years ago, fatty acids were poorly regarded. They were a necessary evil, useful in their place but of a quality and refinement undesirable even at best.

To-day the entire picture is changed. Fatty acids have been developed to such a stage of refinement that the supply can at times scarcely meet the demand created by scores of industries dependent upon the newer fatty acids for their operations. Few divisions of chemistry have made as many advances as has the field of oil and fat chemistry in the past twenty-five years, and the fatty acid division of that field has been perhaps, one of the most striking.

At the risk of repeating well-known information, let us go back for a moment into the history of oil and fat chemistry. Fatty acids are procured principally from the triglycerides of those oils and fats obtained from fish, animals and vegetables. These in their chemical structure are a combination of glycerine and fatty acids—varying according to the type. Fatty acids are mostly long chain monobasic acids.

In the production of fatty acids it is necessary first to split off the glycerine—which varies in amount—depending on the type of the oil. The glycerine being removed, the products that remain are unrefined fatty acids which may be improved by distillation, cold pressing or other means. Equipment available in modern fatty acid plants permits the distillation of the crude acids to a quality not heretofore obtainable—the finished products being completely free of albuminous and oxidized matter, and much lighter in colour than in years gone by.

As to sources, the animal oils are obtained by rendering crude animal fatty parts, and the vegetable oils from such plants as the palm, cocoanut, tung, castor, flax, rapeseed, perilla, soyabean, corn, cotton, olive, sunflower, etc. The fish oils are those obtained from cod, whale and varied entire fish, such as menhaden, herring and sardines.

Each of the above oils has its own chemical characteristics and combinations of fatty acids, and each consequently yields acids varying in their industrial usefulness and applications.

MANUFACTURING PROCESSES

Splitting the glycerine off is usually accomplished by one of three methods: The Twitchell process, in which the oils are boiled with steam in the presence of a catalyst for 24 to 48 hours and the glycerine-water separated by gravity from the fatty acids; a physical process, in which the oils are heated with steam in an autoclave at a pressure of 150 to 350 lbs. per square inch; or by saponifying the oils or fats with alkali to obtain the glycerine and then splitting the saponified material with mineral acid to obtain the fatty acid. In all systems the glycerol water is drawn off, chemically treated, and sent to an evaporating unit which boils off the water and leaves a high concentration of glycerine.

The fatty acids arising from these processes may be sold in their crude form or refined into products of good colour and high purity by distillation and other methods. The pitch remaining from distillation is sold for a number of specialized purposes, such as paints, insulation for electric wiring, roofing and sound-deadening felts, etc.

Maintenance of good colour, as well as chemical purity in the fatty acids, depends upon handling in metals which are not attacked during the processing, storage and packaging. The striking improvements in production methods and the subsequent resulting increase in industrial uses for the purer fatty acids account for the great advances registered in the fatty acid field.

This development toward a larger consumption and the establishment of a full-fledged industry was influenced by four factors: (1) the rapidly rising consumption of lighter-coloured fatty acids in the synthetic resin field; (2) improved manufacturing methods of soaps and cosmetics from fatty acids; (3) the importance of recovering high-grade fatty acids from the by-products of the oil and fat industry; (4) by the esterification of fatty acids in the development of quick-drying synthetic oils for the protective coating industry.

TABLE I

CHEMICAL AND PHYSICAL DATA OF PURE SATURATED MONOCARBOXILIC FATTY ACIDS

$C_nH_{2n+1}COOH$	Formula	Molecular Weight	M.P. °C	Boiling Point °C	mm	d—°C	nD—°C	Solubility in water	(Acid No.) Neutralization value
Formic Acid	$H\cdot COOH$	46.0	+8.6	101	(750.2)	1.2256	1.37137(20)	Soluble	1219.6
Acetic Acid	$CH_3\cdot COOH$	60.0	+17.5	118.5	(760)	1.0697	1.37180(20)	"	935.0
Propionic Acid	$C_2H_5\cdot COOH$	74.1	−22.0	140.7	(760)	0.992	1.39529	"	757.1
Butyric Acid	$C_3H_7\cdot COOH$	88.1	−6.5	162.0	(753)	0.9746(0°C)	1.39906(20)	"	636.8
Valeric Acid	$C_4H_9\cdot COOH$	102.1	?	186.0	(760)	0.9577(0°C)	——	"	549.5
Caproic Acid	$C_5H_{11}\cdot COOH$	116.1	−8.0	202.0	(760)	$0.9240\left(\frac{20}{4}\right)$	1.41635(20)	SlightlySol.	483.2
Caprylic Acid	$C_7H_{15}\cdot COOH$	144.1	16.5	236.0	(760)	$0.9270(0)$	1.42850(20)	" "	389.3
Capric Acid	$C_9H_{19}\cdot COOH$	172.2	31.4	270.0	(760)	$0.8858\left(\frac{40}{4}\right)$	1.42855(40)	Sl. Sol. hot	325.8
Lauric Acid	$C_{11}H_{23}\cdot COOH$	200.2	43.6	225.0	(100)	$0.8830\left(\frac{20}{4}\right)$	1.42655(60)	Insoluble	280.3
Myristic Acid	$C_{13}H_{27}\cdot COOH$	228.2	53.8	250.0	(100)	$0.8584\left(\frac{60}{4}\right)$	1.43075(60)	"	245.8
Palmitic Acid	$C_{15}H_{31}\cdot COOH$	256.3	62.0	271.5	(100)	$0.8412\left(\frac{80}{4}\right)$	1.42693(80)	"	218.9
Stearic Acid	$C_{17}H_{35}\cdot COOH$	284.3	71—71.5	291.0	(100)	$0.8386\left(\frac{80}{4}\right)$	1.43003(80)	"	197.4
Arachidic Acid	$C_{19}H_{39}\cdot COOH$	312.3	77.0	328.0	(760)	——	——	"	179.7
Behenic Acid	$C_{21}H_{43}\cdot COOH$	340.4	80—82	306.0	(60)	——	——	"	164.8
Caranaubic Acid	$C_{23}H_{47}\cdot COOH$	368.4	72.5	—		——	——	"	152.3
Lignoceric Acid	$C_{23}H_{47}\cdot COOH$	368.4	80.5	—		——	——	"	152.3
Cerotic Acid	$C_{25}H_{51}\cdot COOH$	396.0	77.8	—		$0.8359\left(\frac{79}{4}\right)$	1.43636(80)	"	141.7
Montanic Acid	$C_{27}H_{55}\cdot COOH$	424.0	83.0	—		——	——	"	132.3
Melissic Acid	$C_{29}H_{59}\cdot COOH$	452.0	91.0	—		——	——	"	124.1

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For certain purposes in which light, uniform colour and a high degree of purity are required, it is necessary to use straight oils of selected quality in manufacturing the resultant fatty acids. The industry likewise is able to make satisfactory goods from the by-products of other industries, such as the edible oil industry. In the purifying and refining of oils for edible consumption, large quantities of soapstocks result. These soapstocks in many cases can be refined by distillation so that the resultant fatty acids are as pure as those made from the original oils. Practically all fatty acids are purchased according to rigid specifications, and control of manufacturing processes must, of necessity therefore, be correspondingly rigid.

CONSTITUENT ACIDS

The constituent acids of commercial fatty acids may be divided into two groups for better classification, *viz.*, saturated and unsaturated acids. The most common fatty acids are the monocarboxylic acids, either saturated or unsaturated, as exemplified in *Tables I* and *II*.

The advantageous use of distilled fatty acids, compared to oils and split fatty acids, includes, in addition to colour uniformity comparisons, the factor of security in compounding. Also, since distilled fatty acids contain practically no hydroxyl groups, it is easily possible to form light-coloured monoglycerides to be used in the production of very light-coloured resins.

The most common of the distilled technical fatty acids used commercially in alkyd resins, as well as in the soap and textile trades, are listed in *Table III*. This table shows the approximate amount of the various constituents and other valuable data.

Of great importance for commercial evaluation, besides the general composition, is the presence or absence of undesirable impurities, especially hydrocarbons, lactones, metallic soaps, ketones, hydroxyacids, aldehydes and higher alcohols. These compounds either impart discoloration and odour, reduce heat resistance and reactivity, or act as catalysts for unwanted oxidation and side reactions, decidedly unfavourable for alkyd resin production of high quality.

USED IN SOAP MANUFACTURE

In the broad field of soap technology, there are many factors favouring the use of fatty acids rather than whole oils. Fatty acids make soap more quickly with better colour, and soapers can multiply their present capacity several times through their use. Generally 36 to 48 hours are required when working with the whole oils, while with fatty acids the saponification cycle is 3 to 4 hours. Thus the capacity of smaller plants can be greatly increased.

Viewed from the angles of both quality of finished products and cost, the advantages of using fatty acids cannot be denied.

1. Simplicity: The manufacture of soaps from fatty acids is a simpler procedure. The typical method is described in detail later.

2. More uniform product: Fatty acids are more uniform than whole oils because:

   (a) Being manufactured, they can be controlled more easily than natural oils.

   (b) Gross impurities are removed.

   (c) Constants can be adjusted by mixing batches.

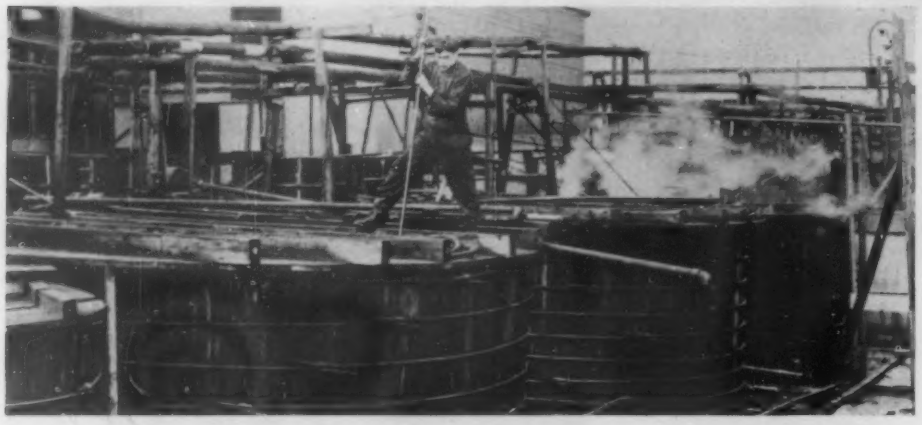
3. Time saving: As the glycerine is already removed, the time of saponification is greatly shortened. Also, since the impurities as well as the glycerine are not present, the long and tedious "salting-out" operation is not required.

4. Easier saponification: Tests may be made for excess alkali or fatty acid shortly after mixing without danger of a slow and

TABLE II

UNSATURATED MONOCARBOXILIC ACIDS

Series	Acid	Formula	Mol. Wgt.	M.P.	Acid No.	Theor. Iod. No. (R = Rossman Method)	Spec. Grav.	B.P.	Refract Index
$C_nH_{2n-1}COOH$	Tiglic	C_4H_7COOH	110	—	510	231			
	Undecylenic	$C_{10}H_{19}COOH$	184	—	304.9	137.9			
	Tetradecenoic	$C_{13}H_{25}COOH$	226	64.5°C	248.2	112.3			
	Palmitoleic	$C_{15}H_{29}COOH$	254	−1.5°C	221.0	100.0			
	Oleic	$C_{17}H_{33}COOH$	282.3	14°C	198.9	89.9	.899 (20°C)		1.4620
	Elaidic	$C_{17}H_{33}COOH$	282.3	24.5°C	198.9	89.9			
	Gadoleic	$C_{19}H_{37}COOH$	310	24.5°C	181.0	81.9			
	Erucic	$C_{21}H_{41}COOH$	338	33−34°C	166.0	75.1		222°C (5mm)	1.44704
	Brassidic	$C_{21}H_{41}COOH$	338	60−66°C	166.0	75.1	.8585 (57°C)		1.44615 (57°C)
$C_nH_{2n-3}COOH$	Linolic	$C_{17}H_{31}COOH$	280	−18°C(?)	200.4	181.3	.903 (20°C)	208°C (11mm)	1.4688
	9, 11 Octadecadienoic	$C_{17}H_{31}COOH$	280	53−54°C	200.4	181.3−R			
$C_nH_{2n-2}OH\cdot COOH$	Ricinoleic	$C_{17}H_{32}OH\cdot COOH$	298	4°C	188.3	85.2			
$C_nH_{2n-5}COOH$	Linolenic	$C_{17}H_{29}COOH$	278	Liquid	201.8	273.4		207°C (15mm)	
	α Elaeostearic	$C_{17}H_{29}COOH$	278	48−49°C	201.8	273.4−R			
	β Elaeostearic	$C_{17}H_{29}COOH$	278	71°C	201.8	273.4−R			
$C_nH_{2n-9}COOH$	Clupanodonic	$C_{21}H_{33}COOH$	330	Liquid	170.0	384.6			



Twitchell tanks for splitting animal, vegetable and fish oils into raw fatty acids and glycerine-water.

delayed reaction altering the finished product. Slight adjustment can be made with little likelihood of later changes.

5. No shrinkage: With distilled fatty acids, the entire fat component goes into the soap, whereas there is a loss in the form of glycerine by those companies which in their processes do not recover the glycerine. Under these conditions, weight by weight, fatty acids will give approximately 5 per cent. more soap than the raw oil from which the fatty acids were obtained.

6. Better choice of alkalis: Milder alkalis can be used which would not react with the raw oil; as triethanolamine.

7. Economy: In addition to lower labour and equipment costs due to producing the same volume of soap in less time, or a much larger volume in the time formerly necessary when making soaps from the oils, there is a resultant saving in fuel and power. Equipment turnover is several times greater.

8. Loss possibility of turbid soaps: Complete saponification prevents turbidity. With oils, even with careful boiling, the saponification reaction is not complete for a long period.

9. Better control of finished soap: It is much easier to obtain a soap that is 100 per cent. saponified from fatty acids. For complete saponification, about 0.12 per cent. excess alkali is required. Also, as the product used as a starting base is a manufactured product, the soap maker is certain of employing a more uniform article than when he starts with Nature's material.

10. Bleaching not necessary. With proper bleaching materials hard to get at this time, it is particularly noteworthy that bleaching is unnecessary when distilled fatty acids are used, because foreign colouring matter has been removed in the fatty acid manufacturing process.

The following typical procedure for batch lot production is a simple and practical one for making soap from fatty acids. (Or it can be made continuously by a proportioning pumping system.)

1. The necessary amount of caustic soda (dry or liquid) is put into a tank and diluted to a concentration of from 8 per cent. to 10 per cent. (Spec. Gravity 1.10) preferably using soft water. Based on caustic soda (NaOH), the amount can be calculated simply as follows:

The saponification number of the fatty acid to be "S"

The amount of fatty acid required to be "F"

Caustic soda (dry flakes) to be used $= \frac{F \times S \times 40}{1000 \times 56 \text{ lbs.}}$

For every pound of dry caustic add five quarts of water; for every pound of 50 per cent. liquid caustic add three quarts of water.

2. The barrels or drums containing the fatty acid are rolled over the dumping pit and allowed to drain.

3. The steam is turned on slightly and the fatty acid is pumped into tank with valves throttled so that the fatty acid entering the lye in the kettle is easily dispersed by the swirling liquid. After all of the fatty acid has been added, proceed with steam agitation and boil to a clear liquid. Then open the valve on tank and start the pump again to wash out lines still containing fatty acid.

The soap in the kettle should then be tested with phenolphthalein. A very slight pink will indicate a practically neutral soap. If too red, more fatty acid is added; if white, more caustic soda should be added in small quantities at a time. Exact pH control can be obtained with standard instruments, or by the usual titrations.

After every addition of new materials, the pump should be started for proper blending. Steam will help materially in finishing the reaction quickly.

If the addition of "builders" is desired, they should be added after the soap is finished in order to conform with the alkalinity. Otherwise it is difficult to maintain uniformity.

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TABLE III

CONSTITUENTS OF COMMERCIAL FATTY ACIDS

Average percentage of acids in		Capric, caprole and caprylic	Lauric	Myristic	Palmitic	Stearic	Higher Saturated	Ricinoleic	Oleic	Linolic	9/11 Octadecadienoic	Linolenic	Eleostearic	Clupanodonic	Acetyl Value	Degree of Unsaturation: Thiocyanide Value	Iodine Value Hanus (1 hour)	Iodine Value Wijs (½ hour)	Iodine Value Wijs (5 days) Rosenmund method	Hexabromide Value
Cocoanut Fatty Acid	Dist.	ca. 13-5	ca. 45-5	ca. 20	ca. 15	ca. 5	-	-	ca. 6	3-4	-	-	-	-	-	5-9-12	8-13	-	-	-
Cottonseed "	"	-	-	-	20-26	2-3	0.5-1.0	-	35-45	30-40	-	-	-	-	-	65-70	90-100	-	-	-
Cotton, High Titre Fatty Acid	"	-	-	ca. 1	40-45	4-5	-	-	22-25	25-30	-	-	-	-	-	40-50	60-75	-	-	-
Chinawood "	Split	Total about 2 - 3%					-	-	5-15	-	-	-	[illegible]-85	-	-	85-90	-	Over 160	About 230-R 240-R	-
Helioline-D "	Dist.	-	-	-	4.5-9	0.5-1	-	-	45-55	40-45	-	-	-	-	-	80-88	120-140	-	-	-
Hempseed "	"	-	-	-	10 - 12		?	-	12-15	50-55	-	20-25	-	-	-	85-100	155-165	-	-	4-17
Isoline "	"	Total about 3 - 4%					-	-	6-9	40-45	40-45	-	-	-	-	?	155-165	135-145	170-178-W	-
Lauric Acid (Tech.)		ca. 15	ca. 58	ca. 20	ca. 9	ca. 1	-	-	ca. 4	-	-	-	-	-	-	2-4(?)	4-6	-	-	-
Linseed Fatty Acid	"	-	-	-	2.7-5.8	5.4-7.7	-	-	6-12	35-47	-	37-42	-	-	-	Below 120	164-190	-	198W	About 40
Marine (Raw) "	Split	Total ca. 15 - 25%					-	-	C16 30(?)	?	Containing jecoleic and therapic acid (?)			+	?	105-110	160-170	-	-	?
Myristic Acid	Dist.	-	ca. 20	ca. 66	ca. 3		-	-	ca. 10	-	-	-	-	-	-	5-6(?)	5-10	-	-	-
Palm Fatty Acid	Split	-	-	1-2	35-45	4-5	-	-	40-50	8-12	-	-	-	-	-	40-50	45-60	-	-	-
Perilla Fatty Acid	Dist.	Total about 6.5 - 8.0 - mostly palmitic					-	-	4.0-10.5	33-44	-	44-49	-	-	-	Below 130	185-200	-	-	Below 60
Rapeseed "	"	-	-	0-1.5	1 - 2		1-3	-	30-40	13-20	Erucic 15-50	1-4	-	-	-	80-83	100-109	-	-	4-7
Ricinoleic "	Split	Total about 3 - 5%						84-87	7-10	1-3	-	-	-	-	155-156	86-93	87-90	-	-	-
Sardine "	Dist.	Total about 10 - 20% - mostly palmitic						-	?	?	Mostly jecoric (?) acid			+	?	?	110-130	-	-	?
Soybean "	"	-	-	-	6.5-10	4.2-6.5	1-2	-	22-29	50-55	-	7-10	-	-	-	80-85	128-138	-	-	5-11
Sunflower "	"	-	-	-	5-4	2 1/2-3 1/2	1-2	-	36-40	52-56	-	-	-	-	-	70-88	125-135	-	-	-

If caustic potash (KOH) is used, rather than caustic soda, the formula will be:

$$\text{Caustic potash (dry flakes) to be used} = \frac{F \times S}{1000}$$

or, to convert from the amount of caustic soda in a formula to the corresponding amount of caustic potash, merely multiply by the factor $\frac{56}{40}$

Caustic potash liquid can also be used if preferred.

Palm fatty acids are preferred for use in toilet soaps, either alone or in combinations, and result in soaps of good colour, odour and a stable character. The soap is not so hard as a tallow soap, but is hard enough to allow proper handling. It is easier to lather and to rinse. These soaps have greater wetting-out power, fair lathering properties and do not cause irritation of the skin.

With the long strides which have been made in fat chemistry over the past decade, there are to-day on the market more pure fatty acids and combinations of fatty acids than there are natural fats. Not only are there the complete fatty acids of the whole oils, such as a soyabean fatty acids, corn oil fatty acids, cocoanut fatty acids, and similar vegetable oil fatty acids, but these complete oil fatty acids have in turn been fractionated to give individual fatty acids such as lauric, myristic, capric, palmitic and others. Several of the more important are herewith described, along with their chemical characteristics.

The Palm Group

Palm fatty acids are mostly obtained from the fruit coat of Palm nuts although palmitic acid itself is also present in the oil of many seed fats, such as cotton, soyabean, corn, etc.

The commercially available palm fatty acids include a variety of types to suit many purposes:

The composition can be expressed approximately by the following two extremes (data for the other members of the Palm Group are either similar or in between):

Split Palm Fatty Acid

Myristic acid	About	1-2 %
Palmitic acid	"	35-43%
Stearic acid	"	4-5 %
Oleic acid	"	40-50%
Linolic acid	"	8-12%

Cotton High Titre Fatty Acid

Myristic acid	About	1 %
Palmitic acid	"	40-45%
Stearic acid	"	4-5 %
Arachidic acid	"	1 %
Oleic acid	"	22-25%
Linolic acid	"	25-35%

(To Be Continued.)

	Acid No.	*Sap. No.*	*Iodine Value*	*Titre*	*Color*
1. Split Palm F.A.	185-190	195-202	48-55	40-45	Orange-brown
2. Palm F.A. Single Dist	196-203	198-206	40-55	42-46	Light brown
3. Palm F.A. Double Dist	198-203	200-206	38-48	44-48	White
4. Cotton High Titre F.A. Dist	200-208	202-210	65-73	43-48	Light

Earlier Vintage Cars Seeking Service as Wartime Conservation Measure

1934-36 Cars Recall Models With Spiral Bevel Gears, Spring Bolts, Shackles, Gland Packed Water Pumps

BY J. HOWARD PILE, *CHEK-CHART Editorial Director*

Under normal peace-time conditions, it is quite the customary thing for car owners to take a great deal of care of new cars, especially during the first six months or year of their life. It is not at all unusual for the average owner to check mileage carefully and see that the crankcase, transmission, differential and all lubrication points are taken care of at very close to the correct mileage interval.

During this period the owner has a new toy and he guards it with the greatest care. Washing, polishing, simonizing—nothing is too good for the new car. And just let somebody scratch one of the fenders or bend a wiper blade and see what happens.

One of our wasteful habits, however, is to get more careless as the newness of an automobile, piece of furniture or other equipment begins to wear off. The material results is that the owner's interest falls off in succeeding years, until in about four, five or six years the car gets a minimum of attention.

The war has made a great change in this situation, however. Service stations which previously found it a waste of breath to try to sell lubrication work and other preventive maintenance service to cars five or six years old, now find that cars of even earlier vintage are being dragged into stations to be put in tip top shape. CHEK-CHART has, within the past few weeks, had requests for technical lubrication information on cars 10 and 11 years old.

The previous practice of concentrating on lubrication of cars from 1937 to 1942 got us pretty well into the habit of thinking of the hypoid gear as the only gear that was ever used in the rear axle of an automobile, and the lubrication of spring bolts and spring shackles is generally thought of as having gone out with the horse-hair sofa.

However, with more of these older cars coming in for service, we must remember there were several violent changes in design between the years 1936 and 1937. Previous to 1936 there were only three or four makes of cars that used hypoid rear axles, but in 1937 a large majority of the high production cars began to use the hypoid axle with hypoid lubricant as a requirement.

Now we must go back and remember that the spiral bevel gears of 1936 and previous years will operate very satisfactorily on straight mineral gear lubricant, even although mild extreme pressure lubricant may do a super job. However, with the scarcity of critical materials, we should, for our own sake and for the sake of our country, use only the minimum grade of lubricant that will properly do the job.

When it is considered that the 1936 models alone constitute 11% of all the cars on the road, it will be seen that we can do an effective job of saving by following car manufacturer's recommendations, as shown on CHEK-CHART, rather than blindly putting hypoid lubricant in every rear axle.

There are a number of other changes or differences in design that show up on models of 1936 and previous, now that we are so used to 1940 or 1942 models. There has been a great change in spring equipment. In the earlier models most of the springs had bolts or shackles which required lubrication, whereas, in more recent cars, the use of rubber has eliminated the necessity of lubrication. In the case of several makes, coil springs, requiring no lubrication, have entirely taken the place of the conventional leaf spring.

Water pumps too have undergone quite a change, as between 1936 and the present day. In the earlier models, many of the water pumps were of the gland packed type, which required waterproof grease, whereas many of these have shifted over to spring loaded packing which requires either a light motor oil or which may be self-lubricated and require no further attention.

There has been quite a good deal of shifting, both in type of lubricant and in recom-

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mended period of service for needle type universal joints, which first came into general use about 1933 and 1934.

Many of the older engines have motor oil recommendations that differ by at least one SAE grade from the more modern cars. It may also be found that some of the older cars have been worn to the extent that one grade heavier than recommended should be used to avoid excessive oil consumption.

The types and grades of lubricants for both transmissions and differentials will be found different in many cases and even the lubricants for transmission overdrives have undergone some change.

In general, it might be said that straight mineral gear lubricants can tend toward the use of SAE 140 grade for summer temperatures, whereas the EP recommendation would generally be found lighter for warm temperatures. In the case of hypoid lubricant, the heaviest grade available for use is SAE 90.

All in all, the lubrication and servicing of older model cars requires some checking and investigation. With the large turnover of help at service stations and the number of new people engaged in the business, it is quite important that exact recommendations be followed in order that the car may give maximum service and that the consumption of critical materials may be kept at the lowest possible point.

Buick Filter Policy Remains Unchanged

Several oil companies have inquired as to any change in policy of Buick regarding the oil filter element. Buick reports there is no change. Buick has recommented to its dealers that the element be removed from 1941 and 1942 model cars and that the filter "can" be left empty. No filter element of any make or type has the approval of the Buick factory.

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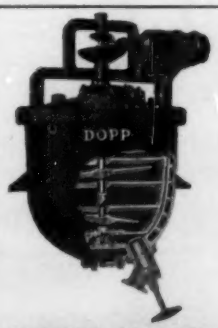

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